Amendments to the Drawings:

Applicants have proposed a new Figure 25 which is an enlargement of a portion of present Figure 22. Both proposed Figures 22 and 25 are enclosed. No new matter has been added.

REMARKS

Applicants appreciate the Examiner's thorough consideration of the above-identified application. In response to the Examiner's request, Applicants submit the following amendments and requests.

The abstract of disclosure is objected to because of the language "is provided." Responsive to the objection, Applicants Wertz et al. have amended the abstract of disclosure and submit that the abstract of disclosure is now in condition for acceptance pursuant to M.P.E.P. § 608.01(b).

The drawings are objected to under 37 C.F.R. 1.83(a). Examiner requested that "the frame able to float laterally relative to the pins and pins connected to the electrical components" be shown or cancelled from the claims. Applicants have accordingly included a new Figure 25, which is an enlargement of a portion of Figure 22.

Claims 1-24 are rejected and pending. Responsive to the objections to claims 8-13, and 19-24, as being dependent upon a rejected base, Applicants Wertz et al. respectfully request that the rejection be removed from each base for the reasons stated below and submit that claims 8-13, and 19-24 are in condition for allowance. Applicants respectfully request such allowance.

Responsive to the rejection of claims 1-6 under 35 U.S.C. §102(e) as being clearly anticipated by Bali et al., Applicants submit that Bali et al. does not disclose, teach, or suggest the subject matter of claim 1, and claims 2-6 depending therefrom. The Examiner suggests that figure 1 of Bali et al. discloses that said LGA interconnect comprises "alignment members projecting from said substrate for aligning said substrate relative to at least one of the electrical components." In their specification, however, Bali et al. discloses said alignment members projecting from *the frame*, not the substrate, for the purpose of alignment. "Referring to FIG. 1, to align the interposer assembly... the interposer assembly, can include one or more alignment pins. As illustrated in FIGS. 2 and 3, the alignment pins are located on tabs that *extend outwards from the frame*" (Bali et al. ¶ 0053) (emphasis added). Bali et al. also teach "to align the apertures with the contact pads or traces of the application, *the frame* can include one or more alignment pins" (Bali et al. ¶ 0060) (emphasis added). Clearly, Bali et al. disclose and teach that the alignment pins project from the frame of their interposer assembly, but does not disclose or teach that the alignment pins project from the substrate to align the substrate or panel to at least one electrical component.

Moreover, Bali et al. teach "in different embodiments, the tabs can include openings instead of alignment pins. Those openings can correspond to and relieve alignment pins included on the printed circuit board or the integrated circuit." Bali et al. does not mention in the specification nor disclose in the drawings alignment pins projecting *from the substrate*. As an alternative to alignment pins projecting from the frame, Bali et al. did not anticipate the alignment pins projecting from the substrate; instead, Bali et al. anticipated alignment pins projecting from the electrical component "in a manner commonly known by those of skill in the art." The commonly known practice is to align the contacts with the interconnected components through the frame. Aligning the contacts with the interconnected components through the frame, as Bali et al. teach, *causes* the alignment of the contacts to be skewed as the density of interconnects increases; therefore, Bali et al. ***teaches away*** from aligning the contacts by way of at least one alignment pin attached to the *substrate* for a more precise alignment to an electrical component.

In contrast, Applicants claim "[a]n LGA interconnect...comprising alignment members *projecting from said substrate* for aligning said substrate to at least one of the electrical components" (Claim 1) (emphasis added). Claim 6 describes the alignment members as "discrete members attached at diametrically opposite positions of said *substrate*." Applicants' invention, as claimed in claim 1, includes distinct advantages over the assembly as disclosed in Bali et al. As the densities of sockets and interconnects increase, the complexity of maintaining alignment also increases. The alignment pins of the Applicants' invention projecting from the substrate allow a precise alignment directly to an electrical component, and allow the housing frame to float relative to the alignment pins, which ensures that the precise alignment is maintained despite stacked tolerance on the frame housing. By projecting the pins from the substrate to align directly to the electrical component with the frame floating relative to the pins, the Applicants are solving the problem created by the alignment through the frame taught by Bali et al.

For all the above reasons, Applicants submit that Bali et al. does not disclose or anticipate the subject matter of claim 1, and claims 2-6 depending therefrom. Removal of the rejection is respectfully requested.

Responsive to the rejection of claims 14-17 under 35 U.S.C. §102(b) as being clearly anticipated by DelPrete et al., Applicants submit that DelPrete et al. does not disclose, teach, or

suggest the subject matter of claim 14, and claims 15-17 depending therefrom. The Examiner suggests that the dashed lines of figure 1 and the "screw holes" of figure 1 (reference 34 in the drawing) in the DelPrete et al. specification disclose "alignment members projecting from said substrate for aligning said substrate relative to at least one of the electrical components." Examiner also suggests that regarding claim 17 from figure 8A DelPrete discloses that "said pins are discrete members attached at diametrically opposite positions of said substrate." In their specification, however, DelPrete et al. disclose in figure 1 that "the contact socket assembly comprises a raised outer frame which is substantially rectangular and has *screw holes* disposed at each corner thereof." (Col. 2, lines 54-57). DelPrete et al. also disclose "a flat cover, as illustrated in FIG. 1, has a plurality of captive screws aligned with the holes of the contact socket assembly." (Col. 4, lines 34-37). DelPrete et al. also teach "[t]he *cover* preferably includes captive hardware, in this case, four screws. (Col. 2, lines 44-45) (emphasis added). Clearly, DelPrete et al. disclose and teach that the alignment pins (screws) project from the *frame cover* of their socket assembly, but does not disclose or teach that the alignment pins project from the *substrate* to align the *substrate* to at least one electrical component.

In addition, DelPrete et al. teach "[a]lignment of a leadless component carrier within the contact socket assembly, and maintenance of compressive forces on the carrier to ensure electrical interconnection between the carrier and the array of contact tips is effected by a combination of the bias clip and one of a variety of socket covers, according to the invention." (Col. 4, lines 9-15). The flat cover support with its four captive screws aligns the contact socket assembly. (Col. 4, lines 48-51). "A plurality of cover beams...on each side of the cover... are dimensioned to put sufficient force on a chip carrier aligned in the contact socket assembly to keep the chip carrier in good alignment and to maintain proper electrical interconnection between the array of contact pins and the leadless component carrier contacts." (Col. 4, lines 58-64). Aligning the contacts with the interconnected components *through the frame cover* or with cover beams to apply force to the contact socket assembly, as DelPrete et al. teach, contributes to *overstressing* the contact assemblies and transferring forces to the interconnected component, which cause *degradation* of electrical connection. Therefore, DelPrete et al. ***teaches away*** from aligning the contacts by way of at least one alignment pin attached to the *substrate* to achieve a more *precise alignment* to an electrical component.

In contrast, Applicants claim "[a]n LGA interconnect...comprising alignment members *projecting from said substrate* relative to at least one of the electrical components" (Claim 14) (emphasis added). Claim 17 describes the alignment members as "discrete members attached at diametrically opposite positions of said *substrate*." Applicants' invention, as claimed in claim 14, includes distinct advantages over the assembly as disclosed in DelPrete et al. The alignment pins of the Applicants' invention are accurately secured directly to the substrate, not the frame cover, and can be used to precisely locate the contacts to the electrical component for connection; securing the alignment pins to the frame cover prevents such precise location to the electrical component. When stacking interconnecting electrical components, the Applicants invention, as claimed in claim 14, is designed to prevent the exact connectivity problems from overstressed contacts created by projecting the pins from the frame cover as taught by DelPrete et al.

For all the above reasons, Applicants submit that DelPrete et al. does not disclose or anticipate the subject matter of claim 14, and claims 15-17 depending therefrom. Removal of the rejection is respectfully requested.

Responsive to the rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Bali et al. as applied to claim 1 above, and further in view of Hoffmeyer, without acquiescing to the appropriateness of the combination of Bali and Hoffmeyer, Applicants submit that Hoffmeyer, alone, or in combination with Bali, does not teach or suggest the subject matter of claim 7. In addition, responsive to the rejection of claim 18 under 35 U.S.C. § 103(a) as being unpatentable over DelPrete et al. as applied to claim 14 above, and further in view of Hoffmeyer, without acquiescing to the appropriateness of the combination of DelPrete and Hoffmeyer, Applicants submit that Hoffmeyer, alone, or in combination with DelPrete, does not teach or suggest the subject matter of claim 18. Therefore, for the reasons discussed below Applicants respectfully submit that claim 7 and claim 18 are in condition for allowance, and respectfully requests removal of the rejections.

Examiner referring to figure 21 of Hoffmeyer's drawings suggests that Hoffmeyer discloses "that a frame housing floats laterally relative to the pins." Examiner also suggests that at the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the frame of Bali so that it floats laterally relative to the pins as taught by Hoffmeyer. Hoffmeyer, however, discloses a *connector* (Fig. 1, no. 19) that has "a frame portion that includes an opening in which circuit module is received." (Col. 3, lines 6-7). Hoffmeyer teaches

that the "[s]tiffener and cap ensure that the electrically connecting elements, the land grid array contacts *on the connector*, and on circuit on module *remain* coplanar during compressive connection." Thus, the frame housing disclosed by Hoffmeyer that is analogous to frame housing of the Applicants' invention is referred to as a "connector" in Hoffmeyer's specification and is referenced by number 19 in the drawings, not number 21 as suggested by Examiner. In addition, this *connector* disclosed in Hoffmeyer does not float relative to the alignment pins. Hoffmeyer does not mention in the specification nor disclose in the drawings a frame housing surrounding the array of contacts that can laterally float.

The arch that Examiner refers to that is referenced by number 21, which floats relative to the alignment pins in Hoffmeyer's drawings, is distinguishable from the *frame housing* claimed by Applicants. This arch is merely a cover with a loading screw used to apply force to the cap that engages the contact array and the interconnected electrical component. *See* Col. 3, lines 44-64. The frame housing that can laterally float relative to said pins as claimed by Applicants' claims 7 and 18 is positioned around a periphery of said substrate and the alignment pins extend through the frame housing for registration directly to said electrical component. *See* claims 14-18. The alignment pins disclosed by Hoffmeyer do not extend through the arch for registration directly to said electrical component; instead, the *stiffener*, referenced by number 17 in Fig. 1, utilizes the alignment pins to "ensure that the printed circuit board and *connector* are aligned within tight tolerances required by the high density of contacts with the arrays." (Col. 3, lines 16-19). Unlike the arch, the stiffener does not float laterally relative to the alignment pins.

In contrast, Applicants claim "a frame housing positioned around a periphery of said substrate (claim 14); wherein said pins extend through said frame housing for registration directly to said electrical component (claim 16) . . . . wherein said frame housing can laterally float relative to said pins" (claim 18). As argued above, allowing the frame housing to float relative to the alignment pins with a direct connection between the contact assembly on the substrate and at least one electrical component provides a distinct advantage over other interconnect assemblies that align the *frame* and the electrical component without allowing the frame to float relative to the alignment pins. Namely, allowing the frame housing to float maintains the precise alignment between the substrate and the electrical component despite stacked tolerance on the frame housing.

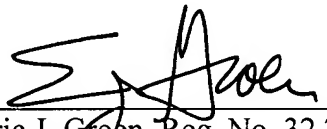
Notwithstanding the fact that Hoffmeyer does not disclose, teach, nor suggest a "frame housing can laterally float relative to said pins," neither Hoffmeyer, Bali et al., nor DelPrete et al. disclose, teach, or suggest "alignment members projecting from said substrate for aligning said substrate relative to at least one of the electrical components." This distinction has been discussed extensively in the above remarks regarding Bali et al. and DelPrete et al. Thus, if the frames of Bali and DelPrete are modified so that they float laterally relative to the pins as taught by Hoffmeyer they still do not disclose alignment pins "attached at diametrically opposite positions of said substrate" (claims 6, 17) that "extend through said frame housing," (claims 5, 16) which "can laterally float relative to said pins" (claims 7, 18). In view of the cited references' lack of disclosure of the claimed invention, Applicants respectfully submit that claim 7 and claim 18 is believed to be in condition for allowance. Removal of the rejections is respectfully requested.

CONCLUSION

Applicants believe that the application, as amended, is now in condition for allowance and action toward that end is respectfully requested. If any issues remain that can be resolved by telephone, Examiner Zarroli is invited to call the undersigned attorney.

In the event that Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorize that any charges be made to Deposit Account No. 02-0390, BAKER & DANIELS.

Respectfully Submitted,

By: 

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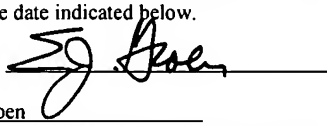
Signature: 

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